



DIST.	COUNTY	ROUTE	KILOMETER POST TOTAL PROJECT	SHEET NO.	TOTAL SHEETS
04	SF	80	13.2/13.9	1137R1	1204

REGISTERED ENGINEER - MECHANICAL

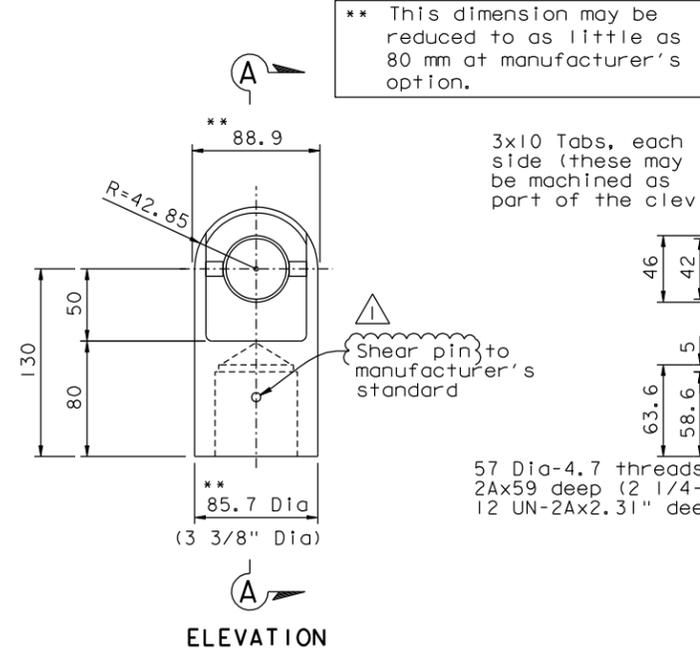
12-6-04

PLANS APPROVAL DATE

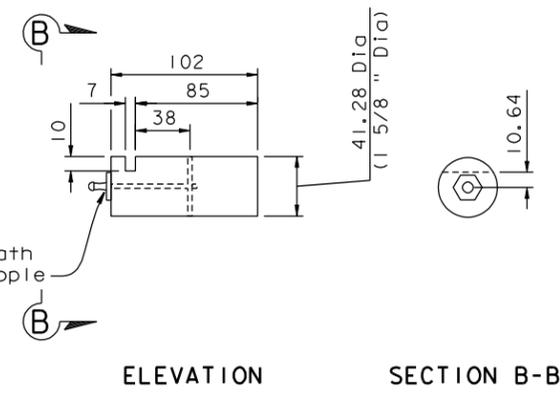
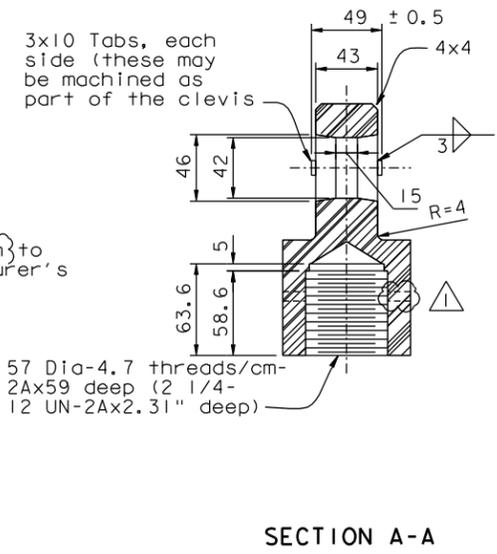
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T.Y. LIN / MOFFATT & NICHOL  
825 BATTERY STREET  
SAN FRANCISCO, CA 94111

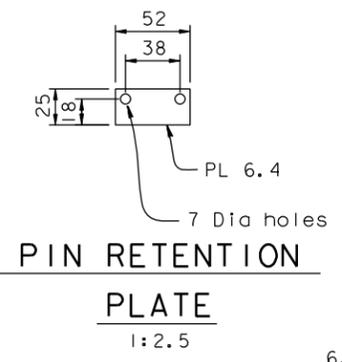
Caltrans now has a web site! To get to the web site, go to: <http://www.dot.ca.gov>



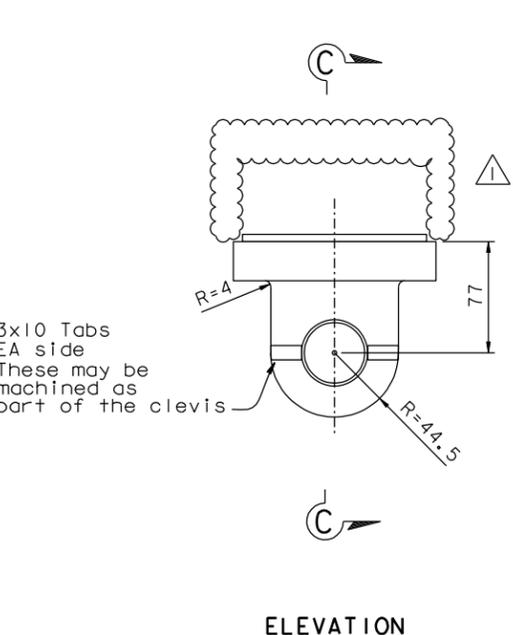
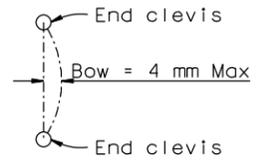
**TOP CLEVIS**  
1:2.5



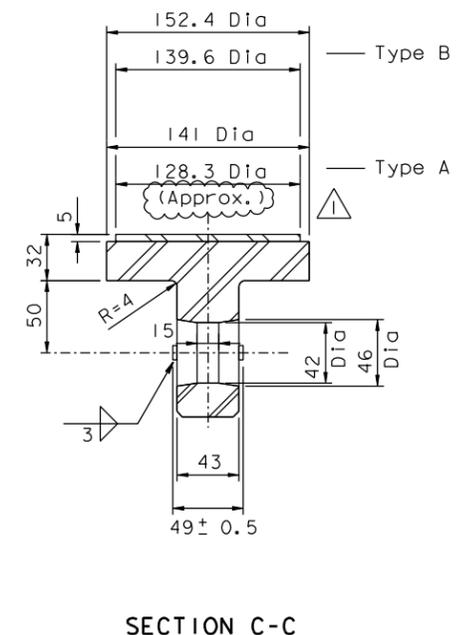
**ACTUATOR PIN**  
1:2.5



- All exterior surfaces of static steel elements to be provided with Marine grade epoxy coating as per specifications.
- All bolts, load screws, worm shafts & protruding shafts to be electroless (Nickel-Tungsten-Boron) plated to a thickness of 0.001 inch.
- For purposes of completing the design of ancillary elements, the actuators selected are Unilift Models M30 and M50 screw jack actuators as manufactured by Templeton, Kenly & Co. Inc. Alternative actuators of equivalent performance and quality are permitted. Closed length and travel are not to be altered. Radius of gyration of the load screw is not to be reduced.
- Threads on load screws to be Stub Acme pattern with a pitch of 0.6 threads per cm (1.5 threads per inch). Do not increase depth of thread cut.
- Note that the drive motors have limited torque capability and will stall out before the service load capacity of the unit is reached.
- For drive motors and mounts see "Linear Actuators And Drives - 04" sheet.
- Manufacturer is to set up the stop nuts in paired actuators (ie. the two actuators on a single elevating platform) such that they will contact & stop travel within 1 mm of each other.
- Actuators to be fabricated to the tolerance shown.



**BOTTOM CLEVIS**  
1:2.5



**LINEAR ACTUATOR NOTES:**

- Load screw to bottom out at bottom clevis to prevent excessive retraction.
- Stop nut to contact stop plate to prevent excessive extension and to prevent the hinge from closing tight.
- Lifted Loads given are service loads.
- Min Structural Factor of Safety required = 5.0 on all loads.  
Min Mechanical Factor of Safety required = 6.0 on all loads.
- Materials:
  - Load Screw - Steel stock to Manufacturer's standards.
  - Pipe - Mechanical tube, Min Fy=300 MPa
  - Top clevis, Shaft retention plate Min Fy=285 MPa
  - Bottom clevis Min Fy=248 MPa
  - Pin - ASTM A572 Grade 50.
  - Welding Electrodes - to be appropriate to the material used. Manufacturer to propose specific materials for each element.
  - Boots to be Neoprene coated nylon with Vulca Seal process complete with air breathers as supplied by Unilift or approved equivalent.
  - Bolts - SAE Grade 8.



CONTRACT CHANGE ORDER NO. \_\_\_\_\_  
SHEET \_\_\_\_ OF \_\_\_\_

REQUESTS FOR INFORMATION NOT ADDRESSED IN THIS CCO REMAIN IN FORCE

FOR REVISIONS ONLY

ALL DIMENSIONS ARE IN MILLIMETERS UNLESS OTHERWISE SHOWN

SAN FRANCISCO OAKLAND BAY BRIDGE EAST SPAN SEISMIC SAFETY PROJECT		BRIDGE NO. 34-0006L/R
SELF-ANCHORED SUSPENSION BRIDGE (SUPERSTRUCTURE & TOWER)		KILOMETER POST 13.2/13.9
<b>LINEAR ACTUATORS AND DRIVES-02</b>		

R. Valizadeh/V. Toan/Y.L./W.L./F.C.	DESIGN	BY J. Otter	CHECKED R. Donikian
DESIGN OVERSIGHT	BY J. Otter	CHECKED R. Donikian	
STGN OFF DATE 09/23/11	QUANTITIES	BY J. Otter	CHECKED M. Roberts

09/23/11	TRAVELER MODIFICATIONS	AS	JD	183
MARK	DATE	DESCRIPTIONS	BY	CH'D
REVISIONS				

**PREPARED FOR THE STATE OF CALIFORNIA DEPARTMENT OF TRANSPORTATION**

R. Manzanarez  
PROJECT ENGINEER

Rev. Date: 5-18-98	ORIGINAL SCALE IN MILLIMETERS FOR REDUCED PLANS	0 10 20 30 40 50 60 70 80 90 100	CU 04 EA 0120F1
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DISREGARD PRINTS BEARING EARLIER REVISION DATES	REVISION DATES (PRELIMINARY STAGE ONLY)	SHEET 720R1
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